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# NASA Procedural Requirements

**COMPLIANCE IS MANDATORY****NPR 7120.5D**Effective Date: March 06,  
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2012[Printable Format \(PDF\)](#)

Request Notification of Change

 (NASA Only)

## Subject: NASA Space Flight Program and Project Management Requirements

**Responsible Office: Office of the Chief Engineer**

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## APPENDIX F. Project Plan Template

### F.1 Template Instructions

The Project Plan is an agreement among the Project Manager, Program Manager, Center Director, and as required, the Mission Directorate Associate Administrator (MDAA). Other Center Directors providing a significant contribution to the project also concur with the Project Plan to document their commitment to provide required Center resources. It defines, at a high level, the scope of the project, the implementation approach, the environment within which the project operates, and the baseline commitments of the program and project. The Project Plan is consistent with the Program Plan. The Project Plan is updated and approved during the project life cycle in response to changes in program requirements on the project or the baseline commitments.

In this Project Plan template, all subordinate plans, collectively called Control Plans, are required. They are based on requirements in NASA Policy Directives (NPDs) and NASA Procedural Requirements (NPRs) that affect program/project planning. Certain Control Plans (the SMA Plan, Risk Management Plan, SEMP, and Software Management Plan) are required to be stand-alone plans with summaries and references provided in the Project Plan. The remaining Control Plans can either be part of the Project Plan or separate stand-alone documents referenced in the appropriate part of the Project Plan. In the case of the latter, the Project Plan contains a summary of and reference to the stand-alone document; the approval authority for the stand-alone Control Plan is the Project Manager.

Each section of the Project Plan template is required. If a section is not applicable to a particular project, indicate by stating that in the appropriate section and provide a rationale. If a section is applicable but the project desires to omit the section or parts of a section, then a waiver must be obtained in accordance with the waiver process for NPR 7120.5D. This waiver approval is documented in Part 4.0, Waivers Log, of the Project Plan.

### F.2 Project Plan Title Page

<p><b>[<i>Project Name</i>] Project Plan</b></p> <p><b>(<i>short title or acronym</i>)</b></p> <p>(Provide a title for the candidate project and designate a short title or proposed acronym in parenthesis, if appropriate.)</p>	
<p>_____</p> <p>Mission Directorate Associate Administrator</p>	<p>_____</p> <p>Date</p>
<p>_____</p> <p>Center Director (as many signature lines as needed)</p>	<p>_____</p> <p>Date</p>
<p>_____</p> <p>Program Manager</p>	<p>_____</p> <p>Date</p>
<p>_____</p> <p>Project Manager</p>	<p>_____</p> <p>Date</p>

Figure F-1 Project Plan Title Page

## F.3 Project Plan Template

### [PROJECT NAME] PROJECT PLAN

#### 1.0 PROJECT OVERVIEW

##### 1.1 INTRODUCTION

Briefly describe the background of the project and its current status, including results of formulation activities, decisions, and documentation. Document the project's category and NASA payload development risk classification (see NPR 8705.4, *Risk Classification for NASA Payloads*) as stated in the program requirements on the project.

##### 1.2 OBJECTIVES

State the specific project objectives and high-level Performance goals levied on the project by the program. Include performance, schedule, cost, and Technology development objectives, as applicable.

### **1.3 MISSION DESCRIPTION AND TECHNICAL APPROACH**

Describe briefly the mission and the mission design. Include key characteristics of the mission, such as launch date(s), flight plans, and the key phases and events on the mission timeline, including end of mission. Use drawings, figures, charts, etc., for clarification. Describe planned mission results, data archiving, and reporting.

Provide a brief description of the technical approach, including constituent launch, flight, and ground systems, operations concepts, and logistics concepts. Describe the systems to be developed (hardware and software), legacy systems, system interfaces, and facilities. Identify major constraints affecting system development (e.g., cost, launch window, required launch vehicle, mission planetary environment, fuel/engine design, and international partners.)

### **1.4 PROJECT AUTHORITY, GOVERNANCE STRUCTURE, MANAGEMENT STRUCTURE AND IMPLEMENTATION APPROACH**

Identify the Center where the Project Manager resides. Describe the governance structure based on the project category. Identify the governing PMC responsible for oversight of the project. Describe other Centers' responsibilities, if any. Describe the chain of accountability and decision path that outlines the roles and responsibilities of the Project Manager, Program Manager, Center Director, Principal Investigator, and Project Scientist (as appropriate), and other authorities as required per the project's categorization.

Define the relationships among various elements and organizations within the project structure, including all stakeholders, team members, and supporting organizations. Describe the project's approach for fostering effective upward and downward communication of critical management, technical, risk, and safety information. Describe the process that the project will follow to communicate with the CMC, Center Director, Program Manager, and governing PMC. Describe briefly the process for problem reporting and subsequent decision-making, clearly describing the roles and responsibilities of all organizations. Describe any use of special boards and committees.

Describe the project management structure consistent with the project WBS, including organization and responsibilities, its integration with the parent program management structure, and NASA Center(s) participation. Describe clear lines of authority within the project team and between the project, the program office, the primary Center, the MD, other participating Centers, and other participating organizations. Illustrate the organization graphically.

Describe briefly the implementation approach of the project, including the acquisition strategy (e.g., in-house, NASA Centers, and contractor primes), partners and partner contributions, if appropriate. Describe briefly other program/project dependencies with NASA, other U. S. Government agencies, and international activities, studies, and agreements. Include make-or-buy decision plans and trade studies.

Describe how participating NASA Centers' implementation policies and practices will be utilized in the execution of the project. Document the agreements on the use of implementation policies and practices between the Project Manager and contributing NASA Centers in this section (or in appendices to the document), along with the project's approach to ensuring that interfaces do not increase risk to mission success.

### **1.5 STAKEHOLDER DEFINITION**

Describe the stakeholders of the project (e.g., PI, Science community, technology community, public, Education community, parent program, and Mission Directorate sponsor) and the process to be used within the project to ensure stakeholder advocacy.

## **2.0 PROJECT BASELINE**

### **2.1 REQUIREMENTS BASELINE**

List or reference the requirements levied on the project by the program in the Program Plan and discuss how these are flowed down to lower levels by summarizing the requirements allocation process. Reference requirements documents used by the project.

### **2.2 WBS BASELINE**

Provide the project's WBS and WBS dictionary to the Level 2 elements. (See Appendix G.)

### **2.3 SCHEDULE BASELINE**

Present a summary of the project's integrated master schedule (IMS), including all critical milestones, major events,

and Agency and project-level reviews throughout the project life cycle. The summary schedule should include the logical relationships (interdependencies) for the critical milestones, major events, project reviews, and critical paths, as appropriate.

## 2.4 RESOURCE BASELINE

Present the project funding requirements by fiscal year. State the NOA in real-year dollars for all years - prior, current, and remaining. The funding requirements are to be consistent with the project WBS and include funding for all cost elements required by the Agency's full-cost accounting procedures. Provide a breakdown of the project's funding requirements to the WBS Level 2 elements. (See Appendix G.)

Present the project's workforce requirements by fiscal year, consistent with the project funding requirements and WBS. The workforce estimate is to encompass all work required to achieve project objectives. Include the actual full-cost civil service and support contractor workforce by providing organization for any prior fiscal years. Include full-cost civil service and support contractor workforce requirements by providing organization for the current fiscal year and remaining fiscal years.

Describe the project's infrastructure requirements (acquisition, renovations, and/or use of real property/facilities, aircraft, personal property, and information technology). Identify means of meeting infrastructure requirements through Synergy with other existing and planned programs and projects to avoid duplication of facilities and capabilities. Identify necessary upgrades or new developments, including those needed for environmental compliance.

## 3.0 PROJECT CONTROL PLANS

### 3.1 TECHNICAL, SCHEDULE, AND COST CONTROL PLAN

Document how the project plans to control project requirements, technical design, schedule, and cost to achieve the program requirements on the project. (If this information is best documented in other control plans, e.g., the Systems Engineering Management Plan, then reference those control plans.) This control plan documents the following:

- a. Describe the plan to monitor and control the project requirements, technical design, schedule, and cost of the project to assure the high-level requirements levied on the project are met.
- b. Describe the project's performance measures in objective, quantifiable, and measurable terms and document how the measures are traced from the program requirements on the project. In addition, document the minimum mission success criteria associated with the program requirements on the project that, if not met, trigger consideration of a Termination Review.
- c. Describe the project's implementation of Earned Value Management (EVM). The following requirements apply:
  - (1) The project's EVM approach is consistent with the participating Center's best practices.
  - (2) The Project's EVM approach is in-place by KDP C and implemented in Phase C through KDP E.
  - (3) Project EVM reporting begins within 60 days after the start of Phase C.
  - (4) As a minimum, EVM principles, as defined by ANSI/EIA-748, *Earned Value Management Systems*, apply from KDP C through KDP E, if the project's life-cycle cost is at or greater than \$20M.
  - (5) If the project's primary NASA Center has a fully validated Earned Value Management System (EVMS), the project uses that system rather than EVM principles.
  - (6) For contracts and subcontracts, application of an EVMS is required as follows:
    - (i) For development or production (including flight and ground support) contracts and subcontracts valued at \$20M or more, the contractor EVMS must comply with the guidelines in ANSI/EIA-748.
    - (ii) For development or production (including flight and ground support) contracts and subcontracts valued at \$50M or more, the contractor EVMS has been formally determined compliant with ANSI/EIA-748 by the cognizant Federal contract management agency.
    - (iii) EVM is not required for grants, non-developmental level-of-effort engineering support services, steady-state operations, basic and applied research, and routine services such as janitorial services or grounds maintenance services; however, application is at the discretion of the Program/Project Manager.
    - (iv) A Contract Performance Report (CPR), Integrated Master Schedule (IMS), WBS, and WBS dictionary are required whenever EVM is required on contracts and subcontracts.
    - (v) In accordance with NFS Part 1834, require IBRs through Phase D for contracts requiring EVM. Schedule such

reviews not later than 180 calendar days after contract award or the exercise of significant contract options, or not later than 60 calendar days after a significant funding or work scope realignment.

d. Describe any additional specific tools necessary to implement the Project's control processes (e.g., the requirements management system, project scheduling system, project information management systems, budgeting, and cost accounting system).

e. Describe the process for monitoring and controlling the IMS.

f. Describe the process for utilizing the project's technical, schedule, and cost reserves to control the baseline.

g. Describe how the project plans to report technical, schedule, and cost status to the Program Manager, including the frequency and level of detail of reporting.

h. Describe the project's internal processes for addressing technical waivers and handling dissenting opinions.

i. Describe the project's descope plans, including key decision dates and savings in cost and schedule and show how the descopes are related to the project's threshold performance requirements.

j. Include a description of the systems engineering organization and structure and how the Project Chief Engineer (PCE) executes the overall systems engineering functions.

### 3.2 SAFETY AND MISSION ASSURANCE PLAN

Develop a project SMA Plan. The SMA Plan addresses life-cycle SMA functions and activities. The plan identifies and documents project-specific SMA roles, responsibilities, and relationships. This is accomplished through a project-unique mission assurance process map and matrix developed and maintained by the project with appropriate support and guidance of the Headquarters and/or Center- SMA organization.

The plan reflects a project life-cycle SMA process perspective, addressing areas including: procurement, management, design and engineering, design verification and test, software design, software verification and test, manufacturing, manufacturing verification and test, operations, and pre-flight verification and test.

The plan also addresses specific critical SMA disciplines, including (as a minimum): safety per NPR 8715.3, *NASA Safety Manual*, and NPR 8705.2, *NASA Human Rating Requirements for Spaceflight Systems*; quality assurance per NPD 8730.5, *NASA Quality Assurance Program Policy*; compliance verification, audit, safety and mission assurance reviews, and safety and mission assurance process maps per NPR 8705.6, *Safety and Mission Assurance Audits, Reviews, and Assessments*; reliability and maintainability per NPD 8720.1B, *NASA Reliability and Maintainability (R&M) Program Policy*; software safety and assurance per NASA-STD-8719.13, *NASA Software Safety Standard*, and NASA-STD-8739.8, *NASA Software Assurance Standard*; quality assurance functions per NPR 8735.2, *Management of Government Quality Assurance Functions for NASA Contracts*; and other applicable NASA procedural safety and mission success requirements.

Describe how the project will develop and manage a Closed Loop Problem Reporting and Resolution System. Describe how the project develops, tracks, and resolves problems. The process should include a well-defined data collection system and process for hardware and software problem and anomaly reports, problem analysis, and corrective action.

Reference the stand-alone SMA Plan here.

### 3.3 RISK MANAGEMENT PLAN

Summarize how the project will implement the NASA continuous Risk management process. Include the initial Significant Risk List and appropriate actions to mitigate each risk. Projects with international or other U.S. Government agency contributions must plan for, assess, and report on risks due to international or other government partners and plan for contingencies.

Develop a stand-alone Risk Management Plan that includes the content required by NPR 8000.4, *Risk Management Procedural Requirements*. Reference the stand-alone Plan here.

### 3.4 ACQUISITION PLAN

The Project Acquisition Plan is developed by the Project Manager, supported by the host Center's Procurement Officer, and must be consistent with the results of the ASP meeting and ASM. It documents an integrated acquisition strategy that enables the project to meet its mission objectives and provides the best value to NASA. In addition, the Acquisition Plan should:

a. Identify all major proposed acquisitions (such as engineering Design study, hardware and software development, and mission and data operations support) in relation to the project WBS. Provide summary information on each such proposed acquisition, including a Contract WBS; major deliverable items; type of procurement (competitive, AO for

instruments); type of contract (cost-reimbursable, fixed-price); source (institutional, contractor, other U.S. Government organizations); procuring activity; and surveillance approach. Identify those major procurements that require a Procurement Strategy Meeting (PSM).

- b. Describe completed or planned studies supporting make-or-buy decisions, considering NASA's in-house capabilities and the maintenance of NASA's core competencies, as well as cost and best overall value to NASA.
- c. Identify the project's approach to creating Contractor incentives that strengthen safety and Mission assurance.
- d. Describe how the project will establish and implement a continuous Risk-Based Acquisition Management (RBAM) process. (See Appendix A for definition.)
- e. Describe all agreements, memoranda of understanding, barter, in-kind contributions, and other arrangements for collaborative and/or cooperative relationships. Include partnerships created through mechanisms other than those prescribed in the FAR. List all such agreements (the configuration control numbers and the date signed, or projected dates of approval) necessary for project success. Include or reference all agreements concluded with the authority of the Project Manager and reference agreements concluded with the authority of the Program Manager and above. Include the following:
  - (1) NASA agreements, e.g., space communications, launch services, inter-Center memoranda of agreement.
  - (2) Non-NASA agreements:
    - (i) Domestic, e.g., U.S. Government agencies.
    - (ii) International, e.g., memoranda of understanding.

### 3.5 TECHNOLOGY DEVELOPMENT PLAN

Describe the technology assessment, development, management, and acquisition strategies needed to achieve the project's mission objectives.

- a. Describe how the project will assess its technology development requirements, including how the project will evaluate the feasibility, availability, readiness, cost, risk, and benefit of the new technologies.
- b. Describe how the project will identify opportunities for leveraging ongoing technology efforts.
- c. Describe the project's strategy for assuring that there are alternative development paths available if/when technologies do not mature as expected.
- d. Describe how the project will remove technology gaps, including maturation, validation, and insertion plans, performance measurement at quantifiable milestones, decision gates, and resources required.
- e. Describe briefly how the project will ensure that all planned technology exchanges, contracts, and partnership agreements comply with all laws and regulations regarding export control and the transfer of sensitive and proprietary information.
- f. Describe the program's technology utilization plan that meets the requirements of NPR 7500.2, *NASA Technology Commercialization Policy*, and NPR 7500.1, *NASA Technology Commercialization Process*.

### 3.6 SYSTEMS ENGINEERING MANAGEMENT PLAN

Summarize the key elements of the project Systems Engineering Management Plan (SEMP). Include descriptions of the Project's overall approach for systems engineering to include system design and product realization processes (implementation and/or integration, verification and validation, and transition), as well as the technical management processes.

Develop a stand-alone SEM that includes the content required by NPR 7123.1, *NASA Systems Engineering Processes and Requirements*. Reference the stand-alone Plan here.

### 3.7 SOFTWARE MANAGEMENT PLAN

Summarize how the project will develop and/or manage the acquisition of software required to achieve project and mission objectives.

Develop a stand-alone Software Management Plan that includes the content required by NPR 7150.2, *Software Engineering Requirements*, and NASA Standard 8739.8, *Software Assurance Standard*. The Plan should be coordinated with the Systems Engineering Management Plan. Reference the stand-alone Plan here.

### 3.8 REVIEW PLAN



SSummarize the project's approach for conducting a continuum of reviews for the project life cycle, including peer reviews. In accordance with Center best practices, program review requirements, and the requirements in NPR 7123.1, *NASA Systems Engineering Processes and Requirements*, provide the names, purposes, content, and timing of the critical milestone reviews.

Explain the reporting requirements for project reviews. Provide the technical, scientific, schedule, cost, and other criteria that will be utilized in the consideration of a Termination Review.

### 3.9 MISSION OPERATIONS PLAN

Describe the activities required to perform the mission. Describe how the project will implement the associated facilities, hardware, software, and procedures required to complete the mission. Describe mission operations plans, rules, and constraints. Describe the Mission Operations System (MOS) and Ground Data System (GDS) in the following terms:

- a. MOS and GDS human resources and training requirements.
- b. Procedures to ensure that operations are conducted in a reliable, consistent, and controlled manner using lessons learned during the program and from previous programs.
- c. Facilities requirements (offices, conference rooms, operations areas, simulators, and test beds).
- d. Hardware (ground-based communications and computing hardware and associated documentation).
- e. Software (ground-based software and associated documentation).

### 3.10 ENVIRONMENTAL MANAGEMENT PLAN

Describe the activities to be conducted with support from the cognizant Environmental Management Office (EMO) to comply with NPR 8580.1, *Implementing the National Environmental Policy Act and Executive Order 12114*. Specifically:

- a. Identify all required permits, waivers, documents, approvals, or concurrences required for compliance with applicable Federal, State, Tribal Government, and local environmental regulations.
- b. Describe the documentation and schedule of events for complying with these regulations, including identifying any modifications to the Center's Environmental Management System (EMS) that would be required for compliance.
- c. Insert into the project schedule the critical milestones associated with complying with these regulations.

### 3.11 LOGISTICS PLAN

Describe how the project will implement NPD 7500.1B, *Program and Project Logistics Policy*, including integrated logistics infrastructure for supply support, maintenance, test and support equipment, training, technical documentation, packaging, handling and transportation, and logistics information systems for the life of the project.

### 3.12 SCIENCE DATA MANAGEMENT PLAN

Describe how the project will manage the scientific data generated and captured by the operational mission(s) and any samples collected and returned for analysis. Include descriptions of how data will be generated, processed, distributed, analyzed, and archived, as well as how any samples will be collected, stored during the mission, and managed when returned to Earth. The Plan should include definition of data rights and services and access to samples, as appropriate. Explain how the project will accomplish the knowledge capture and information management and disposition requirements in NPD 2200.1, *Management of NASA Scientific and Technical Information*, NPR 2200.2B, *Requirements for Documentation, Approval, and Dissemination of NASA Scientific and Technical Information*, NPR 1441.1, *Records Retention Schedules*, as applicable to project science data.

### 3.13 INFORMATION AND CONFIGURATION MANAGEMENT PLAN

Describe the configuration management (CM) approach that the project team will implement, consistent with NPR 7123.1. Describe the structure of the CM organization and tools to be used. Describe the methods and procedures to be used for configuration identification, configuration control, interface management, configuration traceability, and configuration status accounting and communications. Describe how CM will be audited and how contractor CM processes will be integrated with the project. Reference the stand-alone project Configuration Management Plan, if applicable.

Describe how the project will manage information throughout its life cycle, including the development and maintenance of an electronic program library. Explain how the project will ensure identification, control, and disposition of project records in accordance with NPD 1440.6 *NASA Records Management*, and NPR 1441.1,

### *Records Retention Schedules.*

Describe the project's approach to knowledge capture, as well as the methods for contributing knowledge to other entities and systems, including compliance with NPD 2200.1, *Management of NASA Scientific and Technical Information*, and NPR 2200.2B, *Requirements for Documentation, Approval, and Dissemination of NASA Scientific and Technical Information*.

Describe the project's approach to capturing lessons learned in accordance with NPR 7120.6, *Lessons Learned Process*.

## **3.14 SECURITY PLAN**

Describe the project's plans for ensuring security and technology protection, including:

- a. Security Requirements: Describe the project's approach for planning and implementing the requirements for information, physical, personnel, industrial, and counterintelligence/ counterterrorism security and for security awareness/education requirements in accordance with NPR 1600.1, *Security Program Procedural Requirements* and NPD 1600.2, *NASA Security Policy*. Include in the plan provisions to protect personnel, facilities, mission-essential infrastructure, and critical project information from potential threats and other vulnerabilities that may be identified during the threat and vulnerability process.
- b. Information Technology (IT) Security Requirements: Document the project's approach to implementing IT security requirements in accordance with NPR 2810.1, *Security of Information Technology*.
- c. Emergency Response Requirements: Describe the project's emergency response plan in accordance with NPR 1040.1, *NASA Continuity of Operations (COOP) Planning Procedural Requirements*, and define the range and scope of potential crises and specific response actions, timing of notifications and actions, and responsibilities of key individuals.

## **3.15 EXPORT CONTROL PLAN**

Describe how the project will implement the export control requirements specified in NPR 2190.1, *NASA Export Control Program*.

## **4.0 WAIVERS LOG**

Identify NPR 7120.5D requirements for which a waiver has been requested and approved consistent with project characteristics such as scope, complexity, visibility, cost, safety, and acceptable risk, and provide rationale and approvals.

## **5.0 CHANGE LOG**

Track and document changes to the Project Plan.

## **6.0 APPENDICES**

Appendix A Acronyms

Appendix B Definitions

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